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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,525	10/07/2004	Hans Paul Hopper	1600-10900	8880

23505 7590 01/13/2006

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EXAMINER

NEWVILLE, TONI E

ART UNIT	PAPER NUMBER
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3671

DATE MAILED: 01/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/510,525	Applicant(s) HOPPER, HANS PAUL	
	Examiner Toni Newville	Art Unit 3671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. Claims 1 and 20 are objected to because of the following informalities: it is unclear what the applicant is referring to by the limitation of “a power supply system *selectively* supplying the source of energy to the pumping system”. As best understood by the examiner, this is a reference to the ability to modulate the choke valve 74 to alter the pressure of hydrocarbons after passing through power generator 72. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 8, 9, 12-15, 20 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Hofmann, US 5117908.

Regarding claim 1, Hofmann discloses a subsea process assembly comprising:

- An inlet (Figures 3-6) for a multiphase medium;
- A pressure reducing means (8) for reducing the pressure of the multiphase flow from the inlet and creating a source of energy;

- A multiphase separator (11) for separating the multiphase input into individual phases; and
- A pumping system (14, 15) for, in use, pumping at least one of the desired phases to a delivery point (16, 17);
- A power supply system (18) selectively (via modulation of choke 9) supplying the source of energy to the pumping system (14, 15).

Regarding claim 2, the pressure reducing means (8) runs an electric power drive (18).

Regarding claim 8, Hofmann discloses having drive fluid being pumped to the module from an external point (20) (Figure 5).

Regarding claim 9, the pressure reducing means (8) comprises creating a pressure differential in a drive fluid (Figure 3), thereby creating a source of energy.

Regarding claim 12, the multiphase separator (11) is a gravity vertical tank.

Regarding claim 13, the separating process can separate the multiphase fluid into gas and oil (column 2 lines 50-51).

Regarding claim 14, the assembly comprises an individual pump (14, 15) for each phase.

Regarding claim 15, the individual phase pumps (14, 15) are driven by the energy created in the assembly (column 2 lines 61-63).

Regarding claim 20, Hofmann further discloses

- A subsea well (1) for supplying a multiphase flow comprising a hydrocarbon;
- The subsea process assembly described above, further comprising:
 - The inlet to the assembly is in fluid communication with the well (Figures 3-6); and
 - The delivery point (16, 17) receives the recovered hydrocarbon(s) from the subsea process assembly.

Regarding claim 23, the delivery point (16, 17) is a pipeline (16, 17) for removing the product from the field.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann, US 5117908, in view of Dean et. al., US 4848475.

Hofmann discloses a device as described above. Hofmann fails to disclose including a control process module for controlling the pressure reducing means and the pumping system.

Like Hofmann, Dean discloses a subsea assembly for separating and pumping a multiphase flow. Unlike Hofmann, Dean discloses including a control process module (20) for controlling all devices in the assembly, (column 3 lines 8-10) including controllable pumps (16, 26) and a controllable pressure reducing choke (8).

Given the suggestion in Dean, it would have been obvious to one of ordinary skill in the art to include a control process module for controlling the pressure reducing means and the pumping system in Hofmann to automatically accommodate the changes in downhole pressure and fluid volumes seen during well production, thereby improving the efficiency of the system.

6. Claims 4-7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann, US 5117908, in view of Bencze, US 4848471.

Regarding claims 4 and 10, Hofmann discloses a device as described above, including a power supply system (18). However, Hofmann fails to disclose a power drive unit that generates hydraulic, rather than electric, power.

Like Hofmann, Bencze discloses a subsea assembly for transporting well streams. Unlike Hofmann, Bencze discloses the following:

Regarding claim 4,

- A power supply system (23) driven by drive fluid that generates hydraulic power (column 2 lines 61-65) from an external energy source (20) (Figure 2a).

Regarding claim 10,

- And wherein the drive fluid is water from a water injection supply (20).

Given the suggestion in Bencze, it would have been obvious to one of ordinary skill in the art to substitute a hydraulic power drive (Bencze; 23) driven by fluid pumped from an external water injection supply (Bencze; 20) for the electric motor (Hofmann; 18) in Hofmann because hydraulic power is more reliable than electric power.

Regarding claim 5, Hofmann discloses that the external energy source (20) is in the form of electrical energy (18).

Regarding claim 6, Hofmann discloses that the pressure reducing means (8) is driven by a fluid which provides energy in the form of liquid or gas.

Regarding claim 7, Hofmann discloses that the energy from the inlet is obtained by creating a pressure differential in the multiphase flow between the inlet and the separator.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann, US 5117908. Hofmann discloses a subsea assembly that generates a source of energy by reducing the pressure of multiphase flow from the inlet. Hofmann fails to disclose exactly to what pressures the multiphase flow can be reduced. However, it would have been obvious to one of ordinary skill in the art through routine experimentation to significantly lower the multiphase flow pressure – for instance, to below 25 atmospheres – to improve the efficiency both of the separator and the source of energy.

8. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann, US 5117908, in view of Ditria et. al., US 6197095.

Regarding claim 16, Hofmann discloses a device as described above. Hofmann fails to disclose including a solids removal unit for removing a solids slurry prior to separation.

Like Hofmann, Ditria discloses a modular subsea assembly for separating a multiphase fluid. Unlike Hofmann, Ditria discloses a separator (16) capable of separating solids from the incoming fluid (column 5 lines 61-65).

Given the suggestion in Ditria, it would have been obvious to one of ordinary skill in the art to include a solids removal system in the assembly of Hofmann as taught in Ditria to prevent erosion and corrosion of process equipment, thus reducing the frequency of intervention and lowering operating costs.

Regarding claim 17, Hofmann discloses a device as described above. Hofmann fails to disclose a means for injecting exhaust water into a well.

Like Hofmann, Ditria discloses a modular subsea assembly for separating a multiphase fluid. Unlike Hofmann, Ditria discloses a means for injecting exhaust water into a well (column 8 lines 38-46).

Given the suggestion in Ditria, it would have been obvious to one of ordinary skill in the art to include a means for injecting exhaust water into a well because doing so extends the life of the field and eliminates the need to further separate oil from the water.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann, US 5117908, in view of Appleford et. al., WO 01/20128.

Hofmann discloses a device as described above. Hofmann fails to disclose the assembly further comprising a template, a piping mat and a retrievable subsea process module.

Like Hofmann, Appleford discloses a modular subsea assembly for separating a multiphase fluid. Unlike Hofmann, Appleford discloses a template (1), a piping mat (3), and a retrievable subsea process module (2).

Given the suggestion in Appleford, it would have been obvious to one of ordinary skill in the art to include a template, piping mat, and retrievable subsea process module in the assembly of Hofmann because a modular construction as taught in Appleford allows for smaller ships to be used in its installation than a non-modular assembly.

10. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann, US 5117908, in view of Appleford et. al., WO 01/20128, as applied to claim 18 above, and further in view of Ditria et. al., US 6197095.

Hofmann and Appleford disclose a combination of devices as described above. The combination of Hofmann and Appleford fails to disclose a retrievable subsea process module comprised of a retrievable base module and retrievable mini modules.

Like the combination applied in claim 18, Ditria discloses a modular subsea assembly for separating a multiphase fluid. Unlike the combination, Ditria discloses:

A retrievable subsea process module (10), comprising:

- A retrievable base module (12)
- Retrievable mini modules (16, 28, 58)

Given the suggestion in Ditria, it would have been obvious to one of ordinary skill in the art to further separate the process module (Appleford; 2) in the combination applied to claim 18 into a retrievable base module and retrievable mini modules because having smaller assembly pieces further increases the ease of installation on the sea floor.

11. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann, US 5117908, in view of Ditria et. al., US 6197095.

Hofmann discloses a device as described above. Hofmann fails to disclose a means for injecting exhaust water into a well.

Like Hofmann, Ditria discloses a modular subsea assembly for separating a multiphase fluid. Unlike Hofmann, Ditria discloses a well into which surplus water from the separation can be reinjected (column 8 lines 61-67).

Given the suggestion in Ditria, it would have been obvious to one of ordinary skill in the art to include a well into which surplus water from the separation can be reinjected because doing so extends the life of the field and eliminates the need to further separate oil from the water.

12. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann, US 5117908, in view of Dean et. al., US 4848475.

Hofmann discloses a device as described above. Hofmann fails to disclose including a plurality of subsea wells, each having an associated subsea process module which supplies the recovered hydrocarbons to the same delivery point.

Like Hofmann, Dean discloses a subsea assembly for separating and pumping a multiphase flow. Unlike Hofmann, Dean discloses a plurality of subsea wells (column 7 lines 56-59 and Figures 8A, B, and C), each having an associated subsea process module (Figure 1) which supplies the recovered hydrocarbons to the same delivery point (41) (column 8 lines 14-16).

Given the suggestion in Dean, it would have been obvious to include the multi-well assembly to the assembly in Hofmann so that it can process multiple production wells, which are common in subsea fields, while eliminating the need for additional pipelines by routing the fluid to a common delivery point.

Response to Arguments

13. Applicant's arguments filed 11/29/2005 have been fully considered but they are not persuasive. Hofmann states in column 2 lines 46-48 that "to adapt the ERT 8 to varying parameters of the product there is a controlled removal port 9, which opens into the drain duct 10 of the ERT 8". The power supply system 18 therefore may selectively supply the source of energy to the pump system (14, 15) by opening or closing the port 9 to increase or decrease the pressure of hydrocarbons after passing through the pressure reducing means 8.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

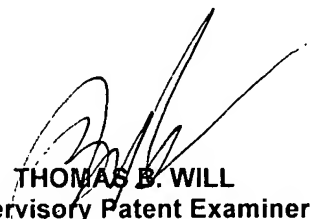
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toni Newville whose telephone number is (571) 272 - 1548. The examiner can normally be reached on Monday - Friday 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas B. Will can be reached on (571) 272-6998. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Toni Newville
January 6, 2005



THOMAS B. WILL
Supervisory Patent Examiner
Group 3600